Notes:
1. Untranslatable words are replaced with asterisks (****).
2. Texts in the figures are not translated and shown as it is.

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FULL CONTENTS

[Claim(s)]
[Claim 1][by carrying out discharge of two or more drops which are the formation methods of a film pattern which breathes out a drop which consists of a liquefied thing containing a film formation ingredient to a predetermined film formation field on a substrate, and forms a film pattern with a droplet discharging method, and are not mixed mutually] A formation method of a film pattern containing what two or more film patterns formed in an adjacent position for.
[Claim 2]A formation method of a film pattern which has a function in which said two or more film patterns formed in said adjacent position differ mutually in Claim 1.
[Claim 3]A formation method of a film pattern which forms said two or more film patterns by carrying out discharge of said two or more drops to a position adjacent in the direction parallel to said substrate in Claim 1 or 2 so that each other may be adjoined in the direction parallel to said substrate.
[Claim 4]A formation method of a film pattern which forms said two or more film patterns in Claim 1 or 2 by carrying out discharge of said two or more drops to the same position in piles mostly so that said substrate and a perpendicular direction may be adjoined.
[Claim 5]A formation method of a film pattern in which the boiling point is lower than a liquefied thing which constitutes a drop by which a liquefied thing which constitutes a drop of one among said two or more drops in Claim 4 was formed above said drop of 1.
[Claim 6]A formation method of a film pattern which forms said two or more film patterns in this crevice by carrying out discharge to a crevice in which said two or more drops were provided by said substrate in Claim 4 or 5.
[Claim 7]A formation method of a film pattern which includes promoting separation of a drop of this plurality by adding centrifugal force to a drop of this plurality in Claim 6 after breathing out said two or more drops to said crevice.
[Claim 8]A formation method of a film pattern said whose 1st drop said two or more drops consist of the 1st drop and 2nd drop, and is a liquefied thing which contains a conductive particulate as said film formation ingredient in either of the Claims 1-7 and in which said 2nd drop is a liquefied thing which contains an insulator as said film formation ingredient.
[Claim 9]A formation method of a film pattern which forms an electric conduction film from said 1st drop, and forms an insulating film from said 2nd drop in Claim 8.
[Claim 10]A formation method of a film pattern which forms said electric conduction film in Claim 9 by performing heat treatment and/or light irradiation to said 1st drop.

[Claim 11]In either of the Claims 1-10, a lyophilic pattern and a liquid repellence pattern are further formed in a predetermined field of said substrate, A formation method of a film pattern which forms said two or more film patterns on this lyophilic pattern by carrying out discharge of an implication and said two or more drops to a field to which it was given to said lyophilic pattern and said liquid repellence pattern.
[Claim 12]A formation method of a film pattern which forms an interface of two or more of said film patterns by removing simultaneously a liquefied thing contained in said two or more drops, respectively by evaporation and/or decomposition in either of the Claims 1-11 without putting to the atmosphere.
[Claim 13][a drop which consists of a liquefied thing containing a film formation ingredient with a droplet discharging method] A forming device of a film pattern which is a forming device of a film pattern which breathes out to a predetermined film formation field on a substrate, and forms a film pattern, and forms a film pattern with a formation method of the film pattern according to any one of claims 1 to 12.
[Claim 14]A forming device of a film pattern which contains a head of 1 which can carry out discharge of said two or more drops in Claim 13.
[Claim 15]A forming device of a film pattern in which a head for exclusive use is installed in Claim 13 for every drop which constitutes said two or more drops.
[Claim 16]A forming device of a film pattern which carries out discharge after mixing a drop of this plurality by this mixing means in Claim 13 including a mixing means which mixes said two or more drops.
[Claim 17]Electric conduction film wiring formed by a formation method of the film pattern according to any one of claims 8 to 10.
[Claim 18]Mounting structure of a semiconductor chip including the electric conduction film wiring according to claim 17.
[Claim 19]An electrooptics device including the electric conduction film wiring according to claim 17.
[Claim 20]A semiconductor device with which said electrode and said insulating layer are formed through a formation method of the film pattern according to claim 1 including an insulating layer which insulates said electrode of each other with a source electrode, a drain electrode, and a gate electrode.
[Claim 21]A luminescent device with which said luminous layer and said electron hole transportation / pouring layer are formed through a formation method of the film pattern according to any one of claims 1 to 7 including a luminous layer and electron hole transportation / pouring layer, and a pair of electrode layers that pinch this luminous layer and this electron hole transportation / pouring layer.
[Claim 22]Electronic equipment containing the electrooptics device according to claim 19.
[Claim 23]Electronic equipment containing the semiconductor device according to claim 20.
[Claim 24]Electronic equipment containing the luminescent device according to claim 21.
[Claim 25]A noncontact card medium which includes the electric conduction film wiring according to claim 17 as an antenna circuit.

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the formation method and film pattern formation devices of a film pattern, such as an insulating film which protects the electric conduction film wiring

used for wiring of an electrode, an antenna, an electronic circuit, an integrated circuit, etc., and this electric conduction film wiring.
[0002]This invention relates to the formation method and film pattern formation device of a film pattern for forming each layer which constitutes an electrooptics device.
[0003]This invention relates to the mounting structure, the semiconductor device, the luminescent device, the electrooptics device, the electronic equipment, and the noncontact card medium of a semiconductor chip.
[0004]
[Background of the Invention]By the ink-jet method, a predetermined material is breathed out on a substrate, and the method of forming in a predetermined pattern the wiring included in various kinds of electrooptics devices and a layer is developed. For example, in the U.S. Pat. No. 5132248 item, the pattern application of the liquefied thing which distributed the conductive particulate is directly carried out by the ink-jet method at a substrate, and the method of performing the stress relief heat treatment and laser radiation, and changing into an electric conduction film pattern is proposed. According to this method, while the process of wiring formation will become sharply easy, there is a merit that there is also little amount of the raw material used, and it ends.
[0005]By the way, in connection with the miniaturization of an element in recent years, the wiring and the insulating layer which are contained in various kinds of electrooptics devices are miniaturized. Especially, a possibility that adjoining wiring will contact and short-circuit becomes large as the wiring used for an electronic circuit, or an electrode and an integrated circuit is miniaturized. Therefore, it becomes important by patterning wiring with sufficient accuracy to secure the insulation during wiring.
[0006]On the other hand, when forming a luminescent device, for example, an organic electroluminescence device, two or more layers (for example, a luminous layer, electron hole transportation / pouring layer, etc.) which constitute an organic electroluminescence device can be formed by the ink-jet method. In this case, generally several different materials are applied in order. When this organic electroluminescence device drives, an electric charge (an electron hole or an electron) moves among said two or more layers which constitute an organic electroluminescence device. In order to obtain an efficient organic electroluminescence device, it is important to improve the mobility of the electric charge between these layers. The mobility of an electric charge can be improved by forming the interface of these layers homogeneously.
[0007]
[Problem to be solved by the invention]The purpose of this invention is to provide the formation method and film pattern formation device of a highly precise film pattern by a simple method that it can form.
[0008]The purpose of this invention is related with the luminescent device and semiconductor device which were formed by the formation method of the formation method of the film pattern for forming each layer which constitutes a luminescent device or a semiconductor device, the film pattern formation device, and this film pattern.
[0009]This invention relates to the mounting structure, the electrooptics device, the electronic equipment, and the noncontact card medium of a semiconductor chip including the electric conduction film wiring formed by the formation method of said film pattern, and this conductive wiring.
[0010]
[Means for solving problem](Formation method of a film pattern), [the formation method of the film pattern of this invention] [by carrying out discharge of two or more drops which are the formation

methods of the film pattern which breathes out the drop which consists of a liquefied thing containing a film formation ingredient to the predetermined film formation field on a substrate, and forms a film pattern with a droplet discharging method, and are not mixed mutually] What two or more film patterns are formed in an adjacent position for is included.

[0011]According to the formation method of the film pattern of this invention, two or more film patterns can be formed in an adjacent position by a simple method with sufficient accuracy. In detail, the column of this embodiment explains.

[0012]The formation method of the film pattern of this invention can take the mode of (1) - (6).

[0013](1) Said two or more film patterns formed in said adjacent position can have a mutually different function. Since several film patterns in which functions differ mutually can be formed simultaneously according to this method, the increase in efficiency of the process of a manufacturing process can be attained. Said two or more patterns can be formed in desired shape, respectively.

[0014](2) By carrying out discharge of said two or more drops to a position adjacent in the direction parallel to said substrate, said two or more film patterns can be formed so that each other may be adjoined in the direction parallel to said substrate.

[0015](3) By carrying out discharge of said two or more drops to the same position in piles mostly, said two or more film patterns can be formed so that said substrate and a perpendicular direction may be adjoined.

[0016]In this case, the boiling point can make it lower than the liquefied thing which constitutes the drop formed above said drop of 1 in the liquefied thing which constitutes the drop of one among said two or more drops. According to this method, the liquefied thing which constitutes said drop of 1 can be removed more easily.

[0017]Said two or more film patterns can be formed in this crevice by carrying out discharge of said two or more drops to the crevice in which it was provided by said substrate in this case. Under the present circumstances, after breathing out said two or more drops to said crevice, it can include promoting separation of the drop of this plurality by adding centrifugal force to the drop of this plurality. According to this method, the drop of this plurality is separated easily and membraneous equalization can be attained in a short time.

[0018](4) Said two or more drops can consist of the 1st drop and 2nd drop, said 1st drop can be a liquefied thing which contains a conductive particulate as said film formation ingredient, and said 2nd drop can be a liquefied thing which contains an insulator as said film formation ingredient. According to this method, an insulating film can be formed with an electric conduction film. Since an electric conduction film can be formed by a brief method with sufficient accuracy, it is hard to produce defects, such as disconnection and a short circuit, and the electric conduction film wiring excellent in reliability can be obtained.

[0019]In this case, an electric conduction film can be formed from said 1st drop, and an insulating film can be formed from said 2nd drop. According to this method, since an insulating film can be formed with an electric conduction film, the increase in efficiency of the process of a manufacturing process can be attained.

[0020]Said electric conduction film can be formed by performing heat treatment and/or light irradiation to said 1st drop in this case. According to this method, the film formation ingredient contained in the 1st drop by a simple method can be solidified.

[0021](5) Said two or more film patterns can be formed on this lyophilic pattern by carrying out

discharge to the field to which said two or more drops were given to said lyophilic pattern and said liquid repellence pattern further including forming a lyophilic pattern and a liquid repellence pattern in the predetermined field of said substrate. Since it can form in the field of a request of the film pattern of this plurality alternatively by forming said lyophilic pattern in the field to form said two or more film patterns in according to this method, the film pattern of desired shape can be formed.

[0022]For example, when substrate treatment for applying said two or more drops to a desired field is performed beforehand, Make a substrate lyophilic by irradiating with UV, or, for example For example, the heptadeca fluoroes 1, 1, and 2 and 2 tetrahydro decyltriethoxysilane, Liquid repelling of the substrate is carried out using fluoro ARUKIRUSHIRAN (FAS) represented by the trideca fluoroes 1, 1, and 2, 2 tetrahydro octyl triethoxysilane, etc., Said lyophilic pattern and said liquid repellence pattern can be created by making only a desired position lyophilic by pattern irradiation of UV to this FAS. Thereby, a film pattern can be formed with sufficient accuracy.

[0023](6) An interface of two or more of said film patterns can be formed by removing simultaneously a liquefied thing contained in said two or more drops, respectively by evaporation and/or decomposition, without putting to the atmosphere. According to this method, since an interface of two or more of said film patterns can be formed in a good state, a function of a film pattern can be improved.

[0024](Forming device of a film pattern), [a forming device of a film pattern of this invention] It is a forming device of a film pattern which breathes out a drop which consists of a liquefied thing containing a film formation ingredient to a predetermined film formation field on a substrate, and forms a film pattern with a droplet discharging method, and a film pattern is formed with a formation method of the above-mentioned film pattern.

[0025]According to the forming device of a film pattern of this invention, two or more film patterns can be formed in an adjacent position often [accuracy] and simply.

[0026]The forming device of the above-mentioned film pattern can contain a head of 1 which can carry out discharge of said two or more drops. A head for exclusive use can be installed for every drop which constitutes said two or more drops. Including a mixing means which mixes said two or more drops, discharge can be carried out, after mixing a drop of this plurality by this mixing means.

[0027](Mounting structure and an electrooptics device of electric conduction film wiring and a semiconductor chip) Electric conduction film wiring of this invention is formed by a formation method of a film pattern of above-mentioned this invention. Mounting structure of a semiconductor chip of this invention and an electrooptics device of this invention include electric conduction film wiring of above-mentioned this invention.

[0028]According to electric conduction film wiring of this invention, it is obtained by a simple method, and it is hard to produce defects, such as disconnection and a short circuit, and a deer can also obtain miniaturized electric conduction film wiring.

[0029](Semiconductor device) Said electrode and said insulating layer are formed through a formation method of a film pattern of above-mentioned this invention including an insulating layer from which a semiconductor device of this invention insulates said electrode of each other with a source electrode, a drain electrode, and a gate electrode.

[0030](Luminescent device) Said luminous layer and said electron hole transportation / pouring layer are formed through the formation method of the film pattern of above-mentioned this invention including a pair of electrode layers in which the luminescent device of this invention pinches a luminous layer and electron hole transportation / pouring layer, and this luminous layer and this electron hole

transportation / pouring layer.

[0031](Electronic equipment and noncontact card medium) The electronic equipment of this invention contains the electrooptics device of above-mentioned this invention, the semiconductor device of above-mentioned this invention, and/or the luminescent device of above-mentioned this invention. The noncontact card medium of this invention includes electric conduction film wiring of above-mentioned this invention as an antenna circuit.

[0032]

[Mode for carrying out the invention]Hereafter, the suitable embodiment of this invention is described, referring to Drawings.

[0033][A 1st embodiment] The formation method of the electric conduction film wiring which is an example of the film pattern formation method of this invention is explained as a 1st embodiment. In this invention, a droplet discharging method is the method of forming on a substrate the material substance which has a desired pattern by carrying out discharge of the drop to a desired pattern, and it may be called the ink-jet method. However, the drop which carries out discharge in this case is a liquefied object containing what is called ink not used for printed matter but the material substance which constitutes a device, and this material substance contains the substance which may function as the electric conduction substance or the quality of an insulator which constitutes a device, for example. With drop discharge, what [not only] is sprayed at the time of discharge but when every drop of a liquefied object is applied continuously, it contains.

[0034]Drawing 1 is a sectional view showing typically a formation method of a film pattern concerning a 1st embodiment to which this invention is applied, and drawing 2 is a top view showing typically a film pattern formed by a formation method of a film pattern concerning a 1st embodiment. The substrate 10 shown in drawing 1 is equivalent to a section in alignment with A-A of drawing 2.

[0035]A wiring formation method concerning this embodiment mainly includes the 1st and 2nd discharge processes and solidification processes of the drops 22a and 24a. Hereafter, each process is explained.

[0036](Discharge process), [a drop which consists of a liquefied thing which contained a film formation ingredient with a droplet discharging method in a discharge process] It is a formation method of a film pattern which breathes out to a predetermined film formation field on a substrate, and forms a film pattern, and discharge of a liquefied thing (the 1st drop) containing a conductive particulate and the liquefied thing (the 2nd drop) containing an insulator is carried out. In this embodiment, a liquefied thing (the 1st drop 22a) containing this conductive particulate and a liquefied thing (the 2nd drop 24a) containing an insulator have the character in which it is not mixed mutually.

[0037]In this embodiment, as shown in drawing 1, the ink jet head 12 which installed by turns the nozzle 11a which carries out discharge of the liquefied thing (the 1st drop 22a) containing a conductive particulate, and the nozzle 11b which carries out discharge of the liquefied thing (the 2nd drop 24a) containing an insulator is used. The drop of these is made to reach the target towards the substrate 10 top in the direction of -Z shown in drawing 1 by carrying out discharge of the 1st drop 22a and 2nd drop 24a to a position adjacent in the direction (the direction of X of drawing 1) parallel to the substrate 10, moving this ink jet head 12 in the direction of Y shown in drawing 1. The pattern which the 1st drop 22a and 2nd drop 24a are arranged by turns in the direction of X of drawing 1, and is prolonged in drawing 1 and the direction of Y of drawing 2 by this is formed (refer to drawing 2).

[0038]As the quality of the material of the liquefied thing (the 2nd drop 24a) containing the liquefied thing (the 1st drop 22a) containing a conductive particulate and an insulator, especially if not mixed mutually, it will not be limited.
[0039]As a liquefied thing containing a conductive particulate, the liquefied thing (dispersion liquid) which made the liquefied thing (carrier fluid) distribute a conductive particulate is used. A conductive polymer, particulates of a superconductor besides metal particulates, etc. to which the conductive particulate used here contains any of gold, silver, copper, palladium, and nickel they are are used.
[0040]These conductive particulates can also coat and use an organic matter etc. for the surface in order to raise dispersibility. As a coating material coated on the surface of a conductive particulate, polymer materials, citrate, etc., such as gelatin and polyvinyl alcohol, can be illustrated, for example.
[0041]As carrier fluid to be used, the above-mentioned conductive particulate can be distributed, and especially if condensation is not caused, it will not be limited.
[0042]As a liquefied thing containing an insulator, the liquefied thing which made carrier fluid distribute an insulator, or the liquefied thing produced by making dissolve an insulator in a solvent is used. Especially the quality of the material of the insulator used here is not necessarily limited, and organic matters, such as inorganic substances, such as oxidization silicon and nitriding silicon, or polyimide resin, and an epoxy resin, can be used for it.
[0043][as a combination of the 1st drop 22a and the 2nd drop 24a] For example, Pye Mel by Asahi Chemical Industry Co., Ltd. (the main solvent: N-methyl 2-pylori boss) can be used as the 2nd drop 24a, using particle dispersion liquid (ULVAC, Inc. make; brand name perfect silver (the main solvent: toluene)) as the 1st drop 22a. Or for example, phenol resin and an epoxy resin are made to distribute said conductive particulate as the 1st drop 22a, A solder resist which makes an epoxy resin etc. the main ingredients can be used as the 2nd drop 24a using what mixed a solvent, a hardening agent, a dispersing agent, an antioxidant, etc. if needed. In this case, phenol resin and an epoxy resin can be stiffened by heat treatment and/or light irradiation.
[0044]As a substrate which should form wiring, various kinds of things, such as Si wafer, silica glass, glass, a plastic film, and a metal plate, can be used. That by which a semiconductor film, a metal membrane, a dielectric film, organic membrane, etc. were formed in the surface of a material board of these various kinds as a foundation layer can also be used as a substrate which should form wiring.
[0045]performing removal etc. of carrier fluid and a solvent which are contained in these drops, after breathing out the 1st and 2nd drops 22a and 24a on a (solidification process), next the substrate 10 -- the 1st and 2nd drops 22a and 24a -- it is alike, respectively and a film formation ingredient contained is solidified.
[0046]A solidification process is performed by performing heat treatment and/or light irradiation to the 1st drop 22a and 2nd drop 24a, for example. Of this process, the electric conduction film 22 and the insulating film 24 are formed. For example, when the liquefied thing contained in the 1st drop 22a and/or 2nd drop 24a evaporates and/or decomposes, by removing a liquefied thing from said drop, the film formation ingredient contained in said drop solidifies, and the electric conduction film 22 and the insulating film 24 are formed by heat treatment. Or for example, of light irradiation, the film formation ingredient contained in the 1st drop 22a and/or 2nd drop 24a solidifies (hardening), and the electric conduction film 22 and the insulating film 24 are formed. According to this method, the film formation ingredient contained in the 1st drop and 2nd drop by a simple method can be solidified, respectively.
[0047]When heat-treating to the 1st drop 22a and 2nd drop 24a and forming the electric conduction film

22 and the insulating film 24, a lamp annealing besides processing by a usual hot plate, an electric furnace, etc. which heat the substrate 10, for example can also perform. Although not limited especially as a light source of the light used for a lamp annealing, an infrared lamp, Excimer lasers, such as a xenon lamp, YAG laser, argon laser, carbon dioxide laser, XeF, XeCl, XeBr, KrF, KrCl, ArF, and ArCl, etc. can be used as a light source.

[0048]It is also possible to advance a heat treatment process simultaneously in parallel with a discharge process in this case. For example, by breathing out said drop, or cooling the ink jet head 12 (refer to drawing 1) to the substrate 10 heated beforehand, and using the low carrier fluid of the boiling point for it, immediately after said drop reaches the target to the substrate 10, evaporation can be advanced from from. According to the above process, as shown in drawing 1 and drawing 2, two or more film patterns (the electric conduction film 22 and the insulating film 24) are formed in an adjacent position. In this embodiment, the example formed so that two or more electric conduction films 22 and insulating films 24 might adjoin each other in the direction (here the direction of Y) parallel to the substrate 10 by turns is shown. That is, as shown in drawing 2, two or more electric conduction films 22 are arranged via the insulating film 24 on the substrate 10. Therefore, in this embodiment, two or more patterns (the electric conduction film 22 and the insulating film 24) formed in the adjacent position have a mutually different function. Since several film patterns (the electric conduction film 22 and the insulating film 24) in which functions differ mutually can be formed simultaneously according to this method, the increase in efficiency of the process of a manufacturing process can be attained. In addition, the electric conduction film 22 and the insulating film 24 can be formed in desired shape, respectively.

[0049]According to the film pattern formation method of this embodiment, two or more film patterns can be formed in an adjacent position by a simple method with sufficient accuracy.

[0050]In this embodiment, a formation method of electric conduction film wiring is illustrated as an example of a film pattern formation method. Securing insulation during adjoining electric conduction film wiring according to this method, it is hard to produce defects, such as disconnection and a short circuit, and electric conduction film wiring excellent in reliability can be formed by a brief method with sufficient accuracy. It explains comparing with formation of general electric conduction film wiring which used the ink-jet method for below about the Reason.

[0051]In a formation method of general electric conduction film wiring using the ink-jet method, As shown in drawing 27, breathe out a drop (the 1st drop) containing a conductive material (S11), and it ranks second, After removing carrier fluid (solvent) contained in this drop by solidification process (S12), through a membraneous inspection and a position ****** process (S13, S14), a drop (the 2nd drop) containing an insulator is breathed out (S15), it ranks second and an electric conduction film and an insulating film are formed according to a solidification process (S16).

[0052]On the other hand, according to the formation method of electric conduction film wiring of this embodiment, as shown in drawing 26, after breathing out a drop containing a conductive material (S2), discharge of the drop which contains an insulator continuously is carried out (S3). Subsequently, an electric conduction film and an insulating film are formed according to a solidification process (S4).

[0053]As explained above, according to the formation method of electric conduction film wiring of this embodiment, since an insulating film can be formed with an electric conduction film, increase in efficiency of a process of a manufacturing process can be attained. For example, since a process of removing said liquefied thing is performed by once when evaporating a liquefied thing (carrier fluid) contained in said 1st and 2nd drops in heat treatment and removing it, simplification of a manufacturing

process can be attained.
[0054]According to the formation method of electric conduction film wiring of this embodiment, detailed electric conduction film wiring can be formed with sufficient accuracy.
[0055]As explained above, in this embodiment, explained a wiring formation method as an example of a film pattern formation method of this invention, but. It is not necessarily limited to a wiring formation method by formation method of a film pattern of this invention, and with a droplet discharging method, If two or more film patterns are formed in a position adjacent by carrying out discharge of two or more drops which are not mixed mutually, material (material which constitutes two or more film patterns) in particular that constitutes two or more drops will not be limited. For example, each layer (for example, a luminous layer and electron hole transportation / pouring layer) which constitutes an organic electroluminescence device can be formed using a formation method of a film pattern of this invention. In this embodiment, although a drop which carries out discharge explained two kinds, the 1st drop and the 2nd drop, of cases, a drop which carries out discharge may be two or more kinds. These points are the same also in a film pattern formation method of 6th and 9th embodiments mentioned later.
[0056][A 2nd embodiment] A 2nd embodiment explains a wiring formation device for enforcing a wiring formation method concerning a 1st embodiment of the above as an example of a film pattern formation device to which this invention is applied. In other embodiments mentioned later, a film pattern formation device concerning this embodiment is applicable similarly.
[0057]Drawing 3 is an outline perspective view of a wiring formation device concerning this embodiment. As shown in drawing 3, the wiring formation device 100 is provided with the following.
The ink jet head group 1.
The direction guide shaft 2 of X for driving the ink jet head group 1 in the direction of X.
The direction drive motor 3 of X made to rotate the direction guide shaft 2 of X.

[0058]It has the mounting base 4 for laying the substrate W, the direction guide shaft 5 of Y for driving the mounting base 4 in the direction of Y, and the direction drive motor 6 of Y.
[0059]The direction guide shaft 2 of X and the direction guide shaft 5 of Y were provided with the pedestal 7 respectively fixed to a predetermined position, and equip the lower part of the pedestal 7 with the control device 8.
[0060]It has the cleaning mechanism section 14 and the heater 15.
[0061]The ink jet head group 1 is provided with an ink jet head which breathes out dispersion liquid containing a conductive particulate, and dispersion liquid containing an insulator from a nozzle (discharge mouth), and gives them to a substrate with a prescribed interval, respectively. This ink jet head can install an ink jet head for exclusive use to dispersion liquid containing a conductive particulate, and dispersion liquid containing an insulator, respectively. And it has come to be able to carry out the discharge of the dispersion liquid individually from these ink jet heads of each according to discharge voltage supplied from the control device 8. It may be made to make dispersion liquid containing a conductive particulate, and dispersion liquid containing an insulator breathe out by the same ink jet head.
[0062]The ink jet head group 1 is fixed to the direction guide shaft 2 of X, and the direction drive motor 3 of X is connected to the direction guide shaft 2 of X. The direction drive motor 3 of X is a stepping motor etc., and if a drive pulse signal of the direction of X is supplied from the control device 8, it will rotate the direction guide shaft 2 of X. And if the direction guide shaft 2 of X is rotated, the ink jet head

group 1 will move in the X-axis or the direction of - X-axis to the pedestal 7.
[0063]The mounting base 4 makes the substrate W to which dispersion liquid are given by this wiring formation device 100 lay, and is provided with the mechanism which fixes this substrate W to a reference position.
[0064]The mounting base 4 is fixed to the direction guide shaft 5 of Y, and the direction drive motors 6 and 16 of Y are connected to the direction guide shaft 5 of Y. The direction drive motors 6 and 16 of Y are the move units containing a stepping motor etc., and when the drive pulse signal of the direction of the Y-axis is supplied from the control device 8, they make the direction guide shaft 5 of Y release. And if the direction guide shaft 5 of Y is made to release, the mounting base 4 will move in the Y-axis or the direction of - Y-axis to the pedestal 7.
[0065]The cleaning mechanism section 14 is provided with the mechanism which cleans an ink jet head group. The cleaning mechanism section 14 moves along with the direction guide shaft 5 of Y with the drive motor 16 of the direction of Y. Movement of the cleaning mechanism section 14 is also controlled by the control device 8.
[0066]The heater 15 is a means to heat-treat the substrate W by a lamp annealing here, evaporates the liquefied thing contained in the drop breathed out on the substrate, and performs heat treatment for changing into an electric conduction film or an insulating film. An injection and interception of the power supply of this heater 15 are also controlled by the control device 8. When solidifying said drop by light irradiation, a light irradiation device can be installed instead of the heater 15.
[0067]In order to carry out discharge of the dispersion liquid to a predetermined wiring formation field, [in the wiring formation device 100 of this embodiment] Relative displacement of the ink jet head group 1 and the substrate W (mounting base 4) is carried out by supplying the predetermined drive pulse signal of the control device 8 to the direction drive motor 3 of X, and/or the direction drive motor 6 of Y, and moving the ink jet head group 1 and/or the mounting base 4. And the discharge voltage from the control device 8 is supplied between this relative displacement at the predetermined ink jet head in the ink jet head group 1, and dispersion liquid are made to breathe out from the ink jet head concerned.
[0068]In the wiring formation device 100 of this embodiment, the amount of discharge of the drop from each head of the ink jet head group 1 can be adjusted with the size of the discharge voltage supplied from the control device 8.
[0069]The pitch of the drop breathed out by the substrate W is determined by the ink jet head group 1, substrate W (mounting base 4) jump relative displacement speed, and the discharge frequency (frequency of discharge voltage supply) from the ink jet head group 1.
[0070]According to the forming device of the film pattern of this embodiment, two or more film patterns can be formed in an adjacent position often [accuracy] and simply.
[0071][A 3rd embodiment] A 3rd embodiment explains an example of the electric conduction film wiring to which this invention is applied.
[0072]Drawing 4 is a top view showing typically the electric conduction film wiring concerning a 3rd embodiment to which this invention is applied. In drawing 4, illustration of the insulating film 24 (refer to drawing 5 (a)) formed between wiring is omitted. Drawing 5 (a) is an extension mimetic diagram of the field B shown in drawing 4, and drawing 5 (b) is a figure showing typically the section in alignment with C-C of drawing 5 (a).
[0073]In this embodiment, the case where the electric conduction film 22 and the insulating film 24 which are obtained by the wiring formation method of a 1st embodiment are applied to rearrangement

wiring of semiconductor IC chip 30 is explained. This electric conduction film 22 and the insulating film 24 can be formed with the wiring formation device of a 2nd embodiment.

[0074]As shown in drawing 4, the terminal 34 formed near the outer edge section and the rearrangement terminal 32 formed inside this terminal 34 are formed in semiconductor IC chip 30. This terminal 34 and the rearrangement terminal 32 are electrically connected by the wiring (electric conduction film wiring) 22. That is, this electric conduction film 22 functions as rearrangement wiring.

[0075]The portion in which the electric conduction film 22 is formed densely exists in this semiconductor IC chip 30, for example like the field B. Since electric conduction film wiring of this embodiment is formed by the wiring formation method of a 1st embodiment using the wiring formation device of a 2nd embodiment, it can secure insulation by arranging the insulating film 24 between the adjacent electric conduction films 22 (refer to drawing 5 (a) and drawing 5 (b)). It is obtained by a simple method by this, and it is hard to produce defects, such as disconnection and a short circuit, and a deer can also obtain the miniaturized electric conduction film wiring.

[0076][A 4th embodiment] A 4th embodiment explains an example of the electric conduction film wiring to which this invention is applied. Drawing 6 (d) is a sectional view showing typically the electric conduction film wiring concerning a 4th embodiment to which this invention is applied, and drawing 6 (a) - drawing 6 (c) are the sectional views showing typically one manufacturing process of the electric conduction film wiring shown in drawing 6 (d), respectively.

[0077]In this embodiment, the case where the electric conduction film 22 obtained by the wiring formation method of a 1st embodiment is formed in the multilevel interconnection of the printed circuit board 40 is explained. This electric conduction film 22 can be formed with the wiring formation device of a 2nd embodiment.

[0078]As shown in drawing 6 (d) at the printed circuit board 40, multilayer (in drawing 6 (d), they are six layers) lamination of two or more wiring layers (electric conduction film 22) is carried out on the base board 41 in which the electric conduction layer 42 was formed. Multilayer lamination of the electric conduction film 22 is carried out on this base board 41. The insulating film 24 is arranged between the electric conduction films 22 adjacent in the direction of X. Polyimide resin can be illustrated as the quality of the material of the insulating film 24 used by this embodiment.

[0079]In order to manufacture this printed circuit board 40, as shown in drawing 6 (a) - drawing 6 (c), in the wiring formation method of a 1st embodiment, and a similar way, the 1st and 2nd drops 22a and 24a are breathed out in a predetermined position with a droplet discharging method, it laminates one layer of layers at a time, and two or more wiring layers are formed. performing removal of carrier fluid and the solvent which are contained in said drop, after laminating a predetermined layer -- the 1st and 2nd drops 22a and 24a -- it is alike, respectively and the film formation ingredient contained is solidified. The solidification can use the method explained in the column of a 1st embodiment. By the above process, the printed circuit board 40 shown in drawing 6 (d) is obtained.

[0080]By this embodiment, after forming all wiring layers that should be formed, explained a case where removed a solvent etc. and each layer was solidified, but. One layer or by performing removal of a solvent etc., etc., whenever it forms several layers, a film formation ingredient may be solidified for a wiring layer which consists of the electric conduction film 22 and the insulating film 24.

[0081]According to this embodiment, it is obtained by a simple method, and it is hard to produce defects, such as disconnection and a short circuit, and a deer can also obtain miniaturized multilevel

interconnection.

[0082][A 5th embodiment] A 5th embodiment explains an example of mounting structure of a semiconductor device to which this invention is applied. Drawing 7 is a sectional view showing typically the CPU loading board 50 concerning a 5th embodiment of example slack of mounting structure of a semiconductor device to which this invention is applied.

[0083]The CPU loading board 50 concerning a 5th embodiment is provided with the printed circuit board 40 concerning a 4th embodiment as shown in drawing 7. CPU58 is carried above the printed circuit board 40. This CPU58 is electrically connected with the printed circuit board 40 via the ball bump 53. The shock absorbing material 56 is arranged on CPU58. This shock absorbing material 56 functions also as heat dissipation material, and the cover 58 is arranged via this shock absorbing material 56 on CPU58.

[0084]According to this embodiment, it is obtained by a simple method, and it is hard to produce defects, such as disconnection and a short circuit, and a deer can also obtain a miniaturized CPU loading board.

[0085][A 6th embodiment] An electric conduction film wiring formation method which is an example of a film pattern formation method of this invention is explained as a 6th embodiment. Drawing 8 (a) is a sectional view showing typically a formation method of a film pattern concerning a 6th embodiment to which this invention is applied. Drawing 8 (b) is a sectional view showing typically a film pattern formed by a formation method of a film pattern concerning a 6th embodiment. Drawing 8 (c) is a top view showing typically a film pattern formed by a formation method of a film pattern concerning a 6th embodiment. Drawing 8 (b) is equivalent to a section in alignment with E-E of drawing 8 (c).

[0086]In this embodiment, by carrying out discharge of two or more drops to the same position in piles mostly explains the case where two or more film patterns are formed so that a substrate and a perpendicular direction may be adjoined. Specifically, discharge of the liquefied thing (the 1st drop 62a) containing a conductive particulate and the liquefied thing (the 2nd drop 64a) containing an insulator is mostly carried out to the same position in piles. Then, by removing a solvent etc., a film formation ingredient is solidified, and the electric conduction film 62 and the insulating film 64 are formed so that the substrate 10 and a perpendicular direction (the direction of Z shown in drawing 8 (b) and a figure (c)) may be adjoined. In this embodiment, it is formed so that the electric conduction film 62 may be covered with the insulating film 64. Two or more patterns (the electric conduction film 62 and the insulating film 64) formed in the adjacent position have a mutually different function.

[0087]The 1st drop 62a and 2nd drop 64a can use the respectively same quality of the material as the 1st drop 22a and the 2nd drop 24a which were used with the wiring formation method of a 1st embodiment.

[0088]The boiling point can make lower than the liquefied thing which constitutes the 2nd drop 64a the liquefied thing which constitutes the 1st drop 62a. Since the 2nd drop 64a is formed above the 1st drop 62a in this embodiment, The liquefied thing which constitutes the 1st drop 62a can be more easily removed by using the material in which the boiling point is lower than the liquefied thing which constitutes the 2nd drop 64a as a liquefied thing which constitutes the 1st drop 62a.

[0089]The wiring formation method concerning this embodiment mainly includes the 1st and 2nd discharge processes and solidification processes of the drops 62a and 64a. Among these, since it is the same as that of the wiring formation method of a 1st embodiment about a solidification process, in this embodiment, only the discharge process of the 1st and 2nd drops 62a and 64a is explained.

[0090]In this embodiment, as shown in drawing 8 (a), the ink jet head 72 which the nozzle 11a which carries out discharge of the liquefied thing (the 1st drop 62a) containing a conductive particulate, and the nozzle 11b which carries out discharge of the liquefied thing (the 2nd drop 64a) containing an insulator adjoined and in which it was installed is used. The drop of these is made to reach the target towards the substrate 10 top in the direction of -Z shown in drawing 8 (b) and a figure (c) by carrying out discharge of the 1st drop 62a and 2nd drop 64a to the same position in piles mostly, moving this ink jet head 72 in the direction of Y shown in drawing 8 (a). It is preferred to make it reach the target so that the 2nd drop 64a may more specifically be put on the 1st drop 62a immediately after making the 1st drop 62a reach the target. Since it consists of a substance which is not mixed mutually, the 1st drop 62a and 2nd drop 64a have separated these drops mutually. The pattern which is formed of the above process so that the 1st drop 62a and 2nd drop 64a may adjoin the substrate 10 and a perpendicular direction (the direction of Z in drawing 8 (b) and drawing 8 (c)), and is prolonged according to it to the substrate 10 and a parallel direction (the direction of Y in drawing 8 (b) and drawing 8 (c)) is formed. Subsequently, a solidification process is performed in the method in the wiring formation method of a 1st embodiment, and a similar way. Two or more film patterns (the electric conduction film 62 and the insulating film 64) are formed in the position which adjoins each other according to the above process as shown in drawing 8 (b) and drawing 8 (c).

[0091]According to the wiring formation method of this embodiment, two or more film patterns can be formed in a position which adjoins the substrate 10 and a perpendicular direction. In particular, in this embodiment, two or more film patterns consist of the electric conduction film 62 and the insulating film 64, and the electric conduction film 62 covered by the insulating film 64 can be formed with a droplet discharging method. Thereby, electric conduction film wiring protected by an insulating film can be formed by a simple method.

[0092][A 7th embodiment] A 7th embodiment explains an example of a noncontact card medium to which this invention is applied. Drawing 9 is an exploded perspective view showing typically the noncontact card medium 400 concerning this embodiment.

[0093](Structure of a device) As shown in drawing 9, [the noncontact card medium 400 concerning this embodiment] In a case which consists of the card base 402 and the card cover 418, the Integrated Circuit Sub-Division chip 408 and the antenna circuit 412 are built in, By either [which is not illustrated / at least] external transceiver machine, electromagnetic waves or electric capacity combination, there is little electric power supply or data transfer, and a basis also performs one side.

[0094]According to this embodiment, a part of antenna circuit 412 (the field I shown in drawing 9) consists of electric conduction film wiring formed by a wiring formation method (refer to drawing 8) concerning a 6th embodiment using a wiring formation device concerning a 2nd embodiment. That is, in the field I of the antenna circuit 412, it comprises the electric conduction film 62 and the insulating film 64 formed so that the electric conduction film 62 might be covered. As for any portions other than the field I, in the antenna circuit 412, the insulating film 64 is not formed on the electric conduction film 62. The insulating film 64 is formed in a field to which wiring is formed in the upper part at least among the antenna circuits 412.

[0095]The terminals 66 and 68 are electrically connected via the wiring 65. A part of this wiring 65 is formed on the insulating film 64. That is, the wiring 65 and the electric conduction film 62 are insulated with the insulating film 64. According to this composition, [a part of antenna circuit 412] [by forming

with a wiring formation method of a 6th embodiment] An insulating film (insulating film 64) can be formed in a part to secure the insulation of the upper wiring (wiring 65) and lower layer wiring (electric conduction film 62) at least, without passing through a process of forming an insulating layer separately on the electric conduction film 62.

[0096]An example of the manufacturing method of the noncontact card medium 400 concerning this embodiment is shown in (the manufacturing method of a device) next drawing 10, and drawing 11. Drawing 10 (a) and drawing 11 (a) are the top views showing typically one manufacturing process of the noncontact card medium shown in drawing 9, respectively. Drawing 10 (b) and drawing 11 (b) are the sectional views showing typically drawing 10 (a) and the section in J-J of drawing 11 (a), respectively.

[0097]First, as shown in drawing 10 (a) and drawing 10 (b), the electric conduction film 62 which constitutes the antenna circuit 412 is formed with the wiring formation device of a 2nd embodiment. Here, a part of antenna circuit 412 (field I) is formed using the wiring formation method of a 6th embodiment, and the same method. Thereby, in the field I of the antenna circuit 412, the insulating film 64 is formed so that the electric conduction film 62 may be covered. As for any portions other than the field I, in the antenna circuit 412, the insulating film 64 is not formed on the electric conduction film 62.

[0098]Subsequently, as shown in drawing 11 (a) and drawing 11 (b), the wiring 65 which electrically connects the terminals 66 and 68 is formed. Here, a part of wiring 65 is formed above the electric conduction film 62 via the insulating film 64. The noncontact card medium 400 is obtained by the above process.

[0099]According to the noncontact card medium 400 of this embodiment, it is hard to produce defects, such as disconnection of the antenna circuit 412, and a short circuit, and, moreover, can be considered as the noncontact card medium in which a miniaturization and slimming down are possible.

[0100][An 8th embodiment] An 8th embodiment explains an example of the electric conduction film wiring to which this invention is applied.

[0101]Drawing 12 is a top view showing typically the electric conduction film wiring concerning an 8th embodiment to which this invention is applied. In drawing 12, illustration of the insulating film 64 (refer to drawing 13 (c)) formed between wiring is omitted. Drawing 13 (a) - drawing 13 (c) are the sectional views showing typically one manufacturing process of the electric conduction film wiring shown in drawing 12, respectively, and correspond to the section which met F-F of drawing 12, respectively.

[0102]In this embodiment, the case where the electric conduction film 62 and the insulating film 64 which are obtained by the wiring formation method of a 6th embodiment are applied to rearrangement wiring of semiconductor IC chip 80 is explained.

[0103]As shown in drawing 12, the terminal 82 formed near the outer edge section and the rearrangement terminal 84 formed inside this terminal 82 are formed in semiconductor IC chip 80. This terminal 82 and the rearrangement terminal 84 are electrically connected by the wiring (electric conduction film wiring) 62. That is, this electric conduction film 62 functions as rearrangement wiring.

[0104]Next, the manufacturing method of this semiconductor IC chip 80 is explained with reference to drawing 13 (a) - drawing 13 (c).

[0105]First, as shown in drawing 13 (a), after forming in a prescribed position of the substrate 81 the terminal (pad) 82 which consists of metal layers, such as aluminum and gold, for example, the insulating layer 83 which consists of polyimide resin, for example is formed in the whole surface. Subsequently, the opening 85 is formed in a position which is equivalent to the upper part of the terminal 82 in the

insulating layer 83.

[0106]Subsequently, as shown in drawing 13 (b), discharge of the 1st drop 62a and 2nd drop 64a is carried out in a wiring formation method of a 6th embodiment, and a similar way. In this process, discharge of the 2nd drop 64a is not carried out to a position in which the rearrangement terminal 84 is formed behind. Thereby, the opening 87 is formed in the 2nd drop 64a. Subsequently, a solvent of these drops, etc. are removed, a film formation ingredient is solidified, and the electric conduction film 62 and the insulating film 64 are formed.

[0107]Subsequently, a ball bump is formed in the opening 87 as shown in drawing 13 (c). This ball bump functions as the rearrangement terminal 84 by connecting with the electric conduction film 62 exposed on the bottom of the opening 87. By the above process, semiconductor IC chip 80 shown in drawing 12 is obtained.

[0108]According to this embodiment, when only the part which is due to form the rearrangement terminal 84 does not carry out discharge of the 2nd drop 64a, the opening 87 is formed in the insulating film 64. Thereby, the rearrangement terminal 84 can be directly formed on the electric conduction film 62. As a result, it is obtained by a simple method, and it is hard to produce defects, such as disconnection and a short circuit, and a deer can also obtain the miniaturized electric conduction film wiring.

[0109][A 9th embodiment] The electric conduction film wiring formation method which is an example of the film pattern formation method of this invention is explained as a 9th embodiment. Drawing 14 is a sectional view showing typically the formation method of the film pattern concerning a 9th embodiment to which this invention is applied. Drawing 15 is a figure explaining one formation process of the formation method of the film pattern concerning a 9th embodiment.

[0110]In this embodiment, by carrying out discharge to the crevice 96 in which two or more drops were provided by the substrate 91 explains the case where two or more film patterns (the electric conduction film 62 and the insulating film 64) are formed in the crevice 96. Here, two or more film patterns (the electric conduction film 62 and the insulating film 64) can be formed so that the substrate 91 and a perpendicular direction (the direction of Z shown in drawing 14) may be adjoined.

[0111]A wiring formation method concerning this embodiment is the same as a wiring formation method concerning a 6th embodiment except a point which carries out discharge of two or more drops to the crevice 96. Specifically in this embodiment, discharge of a liquefied thing (the 1st drop 62a) containing a conductive particulate and the liquefied thing (the 2nd drop 64a) containing an insulator is mostly carried out to the crevice 96 in piles in the same position. Then, by removing a solvent etc., a film formation ingredient is solidified, and the electric conduction film 62 and the insulating film 64 are formed in the crevice 96 so that the substrate 10 and a perpendicular direction (the direction of Z shown in drawing 14) may be adjoined.

[0112]The 1st drop 62a and 2nd drop 64a can use the respectively same quality of the material as what was used with a wiring formation method of a 6th embodiment. In this case, as for specific gravity of the 1st drop 62a, it is desirable that it is larger than specific gravity of the 2nd drop 64a.

[0113]After breathing out the 1st drop 62a and 2nd drop 64a to the crevice 96, for example, as shown in drawing 15, separation of the 1st drop 62a and the 2nd drop 64a can be promoted by giving centrifugal force if needed, applying the substrate 91 to a centrifuge. According to this method, the 1st drop 62a and 2nd drop 64a are separated easily, and membraneous equalization can be attained in a short time.

[0114]According to the wiring formation method of this embodiment, the same operation and effect as the wiring formation method of a 6th embodiment can be generated.
[0115][A 10th embodiment] A 10th embodiment explains an example of the mounting structure of the semiconductor device to which this invention is applied.
[0116](Structure of a device) Drawing 16 (a) is a sectional view showing typically the IC chip layered product 70 concerning a 10th embodiment of example slack of the mounting structure of the semiconductor device to which this invention is applied, and drawing 16 (b) is an extension mimetic diagram of the field G portion of drawing 16 (a).
[0117]The IC chip layered product 70 concerning a 10th embodiment is formed by laminating two or more IC chips 70a, as shown in drawing 16 (a). Although drawing 16 (a) shows the case where IC chip 70a of four sheets is laminated, in the IC chip layered product 70, the lamination number of sheets of IC chip 70a is not necessarily limited to this.
[0118]As for IC chip 70a, the electronic circuit (not shown) is formed in the surface, respectively. Up and down adjacent IC chip 70a is electrically connected by the contact part 76. Drawing 16 (b) is a this about 76 contact part extension mimetic diagram. Up and down adjacent IC chip 70a is electrically connected via the contact part 76.
[0119]The contact part 76 contains the electric conduction film 62 and the insulating film 64. This electric conduction film 62 and the insulating film 64 are formed in the crevice (opening 75) provided in the substrate 71. The electric conduction layer 77 is formed in the side of the opening 75. The electric conduction layer 77 has connected with the electric conduction film 62 in the lower part of the opening 75, and has connected with the wiring layer 73 near the upper part of the opening 75. Therefore, the electric conduction film 62 is electrically connected with the wiring layer 73 via the electric conduction layer 77.
[0120]Contact part 76 comrades of adjacent IC chip 70a are electrically connected via the pad 78. [namely by the electric conduction layer 77 of lower layer IC chip 70a and/or the wiring layer 73, and the pad 78 connecting and connecting with this pad 78, and the electric conduction layer 77 of upper IC chip 70a and/or the wiring layer 73] Lower layer IC chip 70a and upper IC chip 70a are electrically connected.
[0121]An example of (a manufacturing method of a device), next a manufacturing method of the IC chip layered product 70 concerning this embodiment is shown. Drawing 17 (a) - drawing 17 (d) are the sectional views showing one manufacturing process in a manufacturing method of the IC chip layered product 70 shown in drawing 16 (a), respectively.
[0122]First, as shown in drawing 17 (a), the pad 78 and the adhesion material 79 are formed in the surface of the substrate 71 of lower layer IC chip 70a among two or more IC chips 70a laminated. The pad 78 is formed with plating or a droplet discharging method.
[0123]A crevice (opening 75) is formed in upper IC chip 70a. Subsequently, the electric conduction layer 73 which becomes the side of this opening 75, for example from gold or copper is formed, and the wiring layer 77 linked to this electric conduction layer 73 is formed further. Before forming the electric conduction layer 73 if needed, a barrier layer which consists of nitriding **** of a high-melting point metal layer and/or a high-melting point metal layer, for example, Ta, TaN, Ti, and TiN can also be formed. In this process, a formation order in particular of the wiring layer 77 and the electric conduction layer 73 is not limited.

[0124]Subsequently, as shown in drawing 17 (b), lower layer IC chip 70a and upper IC chip 70a are pasted together. Here, physical connection is maintained by the adhesion material 79. The adhesion material 79 can also connect lower layer IC chip 70a and upper IC chip 70a, without using the adhesion material 79 depending on a grade of a demand of mechanical strength. Subsequently, discharge of a liquefied thing (the 1st drop 62a) containing a conductive particulate and the liquefied thing (the 2nd drop 64a) containing an insulator is mostly carried out to the opening 75 in piles with a droplet discharging method in the same position using a wiring formation method concerning a 9th embodiment, and same method. Then, a solvent etc. are removed, a film formation ingredient is solidified, and as shown in drawing 17 (c), the electric conduction film 62 and the insulating film 64 are formed in the opening 75 so that the substrate 71 and a perpendicular direction may be adjoined. A centrifugal separation process mentioned above can also be performed after this process if needed. The contact part 76 is formed according to the above process.

[0125]Subsequently, as shown in drawing 17 (d), after forming the pad 78 on the substrate 71 of upper IC chip 70a, another IC chip 70a is laminated in the upper layer, and the contact part 76 is similarly formed in it. The IC chip layered product 70 shown in drawing 16 (a) and drawing 16 (b) is obtained through the above process.

[0126]According to this embodiment, it is obtained by a simple method, and it is hard to produce defects, such as disconnection and a short circuit, and a deer can also obtain the miniaturized IC chip layered product.

[0127][An 11th embodiment] An example of the film pattern formation method of this invention is explained as an 11th embodiment. Drawing 18 (a) - drawing 18 (d) are the sectional views showing typically the drop formed by the formation method of the film pattern applied to an 11th embodiment to which this invention is applied, respectively.

[0128]In the case where it has the character in which the 1st drop 112a and 2nd drop 114a are not mixed mutually, in this embodiment, After maintaining the state of the interface between each drop by carrying out discharge of these drops to the same position in piles mostly, without passing through a solidification process, by performing a solidification process explains the example which forms a film pattern. In drawing 18 (a) - drawing 18 (d), the case where the specific gravity of the 1st drop 112a is larger than the specific gravity of the 2nd drop 114a is explained.

[0129]In drawing 18 (a), since the specific gravity of the 1st drop 112a is larger than the specific gravity of the 2nd drop 114a, as a result of these drops' carrying out layer separation, the 2nd drop 114a is arranged rather than the 1st drop 112a at the upper layer. An order in particular that carries out discharge of the 1st drop 112a and 2nd drop 114a in this case is not limited, but the heavier one [specific gravity] is arranged at a lower layer.

[0130]In drawing 18 (b), more greatly [specific gravity of the 1st drop 112a] than specific gravity of the 2nd drop 114a, since there are quite more amounts of discharge of the 2nd drop 114a than the amount of discharge of the 1st drop 112a, it is formed so that the 2nd drop 114a may cover the 1st drop 112a.

[0131]In drawing 18 (c), the 1st drop 112a and 2nd drop 114a are formed in the crevice 116. Also in this case, specific gravity of the 1st drop 112a is larger than specific gravity of the 2nd drop 114a. In this example, processing in which the bottom 116a of the crevice 116 established in the insulating layer 118 has liquid repellance to the 1st drop 112a is performed. Therefore, rather than the 2nd drop 114a, since

specific gravity is large, the 1st drop 112a tends to move to a direction of the bottom 116a of the crevice 116, but. Since processing which has liquid repellance to the 1st drop 112a is performed to the bottom 116a, a part of 2nd drop 114a remains in the bottom 116a. Same effect is acquired also by performing processing which has lyophilicity for the bottom 116a of the crevice 116 to the drop 114a. Thereby, as shown in drawing 18 (c), the 1st drop 112a is inserted into the 2nd drop 114a, and what is called sandwich construction is formed.

[0132]For example, in structure of drawing 18 (c), a liquefied thing containing a conductive particulate can be used as the 2nd drop 114a using a liquefied thing containing an insulator as the 1st drop 112a. In this case, a film pattern finally obtained after performing a solidification process if needed comprises the two-layer electric conduction film 114 and the insulating film 112 inserted with this electric conduction film 114. In this case, this film pattern can function, for example as a capacitor.

[0133]In this way, after making it separate into two-layer and making it the target film structure, a film pattern made into the purpose is formed by using methods, such as natural neglect, heating, and decompression, removing a solvent (carrier fluid), and solidifying a film formation ingredient.

[0134]In this embodiment, a separation form is not limited to what was mentioned above, but can control a separation form of a drop arbitrarily by controlling lyophilicity to specific gravity of a drop to be used, the amount of dropping, and a drop at the bottom, and liquid repellance. in order to prevent a fluid ingredient contained in a drop breathed out previously evaporating -- a substrate or a system -- the whole can also be cooled. Although an example mentioned above showed a case where there were two kinds of drop, a kind of drop may not necessarily be limited to this and three or more kinds may be sufficient as it. When using three kinds of drops, three layers produced by making breathe out these drops can be made to separate by, for example, using a solvent (or carrier fluid) used for each drop as a nonpolar organicity system fluid with heavy specific gravity, a basin system fluid whose specific gravity is a degree in the middle, and a nonpolar organicity system fluid with light specific gravity.

[0135]Since it can form according to the formation method of the film pattern of this embodiment, without exposing the interface of the film which constitutes the obtained film pattern in the external world also at once, the characteristic as a device can be raised remarkably.

[0136][A 12th embodiment] A 12th embodiment explains the example of the semiconductor device to which this invention is applied. Drawing 19 (a) is a top view showing typically the thin-film transistor (TFT) 120 concerning an example slack book embodiment of a semiconductor device, and drawing 19 (b) is a figure showing typically a cutting plane [in / for TFT120 shown in drawing 19 (a) / H-H].

[0137]TFT120 shown in drawing 19 (a) is formed with the application of the formation method of the film pattern of an 11th embodiment. The gate electrode 122 in which this TFT120 consists of silver on the substrate 121, for example is formed. On this gate electrode 122, the insulating layer 124 which consists of oxidization silicon, for example is formed. This insulating layer 124 is installed in order to insulate the gate electrode 122, and the source / drain field 126,127. The channel field 125 which consists of amorphous silicone is formed so that the insulating layer 124 may be covered. On this channel field 125, the source / drain field 126,127 which consists of doped silicon, for example are formed. The source / drain electrode 128,129 is formed on this source / drain field 126,127.

[0138]In this embodiment, the gate electrode 122, the source / drain electrodes 128 and 129, the channel field 125, the source / drain field 126,127, and the insulating layer 124 are formed by each with the formation method of the film pattern of an 11th embodiment.

[0139]In this embodiment, each layer can be formed by evaporating the liquefied thing contained in these layers, respectively, removing it, and solidifying a film formation ingredient. Therefore, the interface between each layers can be formed, without putting to the atmosphere. Thereby, the interface between each layers can be formed in a good state. As a result, the function of each layer can be improved.

[0140]Next, the example of 1 experiment of the manufacturing method of this TFT120 is explained with reference to drawing 20 (a) - drawing 20 (e). This manufacturing method is an example and can form an electrode, an insulating layer, etc. using the quality of the materials other than the quality of the material shown here. In drawing 20 (a) - drawing 20 (e), a left-hand side figure is a top view showing one manufacturing process of TFT120 of this embodiment typically, and shows the portion corresponding to the top view of drawing 19 (a). In drawing 20 (a) - drawing 20 (e), a right-hand side figure is a figure showing the section of a left-hand side figure, and shows the section corresponding to the sectional view of drawing 19 (b).

[0141]First, the quartz board 121, hexafluoro one 1, 1, and 2, and 0.1 g of 2-tetrahydro decyltriethoxysilane were put into the airtight container with a capacity of 10 l., and were held at 120 ** for 2 hours. Thereby, liquid repelling of the whole surface of the substrate 121 was carried out. Subsequently, in order to perform mask UV irradiation and to form a gate electrode, the 10-micrometer-wide lyophilic pattern (not shown) was formed. Subsequently, with the droplet discharging method, on this lyophilic pattern, as a silver granule child 10 nm in diameter breathed out the water dispersion currently distributed at 10wt% of a rate at intervals of every 5 pl 30 micrometers and showed it to drawing 20 (a), the 1-mm-long coating film 122a was formed at 10 micrometers in width.

[0142]Subsequently, before this coating film 122a got dry, the 25wt% xylene solution of polysilazane was breathed out at intervals of every 10 pl 30 micrometers from another ink jet head towards the same place as the field in which the coating film 122a is formed, and the coating film 124a was formed. According to this process, as shown in drawing 20 (b), the coating film 122a and the coating film 124a made to reach the target on the coating film 122a caused layer separation, and it was established on the substrate 121 in the form where the coating film 124a covers the coating film 122a completely. Under the present circumstances, in order to delay that the coating film 122a breathed out previously gets dry, element formation was performed, keeping the whole system at 10 **, but the method of suppressing evaporation of a solvent (carrier fluid) can be taken by carrying out the whole system under solvent atmosphere depending on the solvent to be used. In this process, some coating films 122a were exposed as an object for wiring connection (refer to drawing 20 (b)).

[0143]Next, after holding for 30 minutes at 80 ** and removing completely the water in the coating film 122a, and xylene in the coating film 124a, decompressing this substrate to 20torr, it heated at 350 ** in atmospheric pressure for 10 minutes. Thereby, as shown in drawing 20 (c), the gate electrode 122 which consists of silver, and the insulating layer 124 which consists of oxidization silicon were formed. The film thickness of the insulating layer 124 was 60-80 nm as a result of measurement.

[0144]Subsequently, according to the photo lithography process, after forming the amorphous silicone film (not shown) of 150 nm of film thickness in the whole surface with a plasma CVD method, as shown in drawing 20 (d), the channel field 125 of 500 micrometer around was formed.

[0145]Subsequently, the solution filtered and obtained after irradiating 20 ml of toluene solution which mixed white phosphorus 1wt% 12wt%, and in which cyclo pen TASHIRAN was dissolved with UV

whose wavelength is 254 nm for 15 minutes was breathed out on the channel field 125 with the droplet discharging method. Here, said solution was breathed out so that the 10-micrometer crevice 125a might be formed in the portion located in right above [gate electrode 122] (refer to drawing 20 (e)).
Subsequently, by calcinating the substrate 121 whole at 400 **, as shown in drawing 20 (e), the source / drain field 126,127 which consists of dope silicon were formed.
[0146]Subsequently, using the same silver dispersion liquid as what was used on the occasion of formation of the gate electrode 122, the source / drain electrode 128,129 was formed so that a source / drain field 126,127 might be touched with a droplet discharging method, respectively. By the above process, as shown in drawing 19 (a) and drawing 19 (b), TFT120 was obtained.
[0147]As a result of measuring the voltage-current characteristic of TFT120 obtained by the above-mentioned process, it operated as a transistor of 0.3 cm of mobility ^{2}/Vs.
[0148][A 13th embodiment] A 13th embodiment explains the example of the electronic equipment to which this invention is applied. Drawing 21 is a figure showing plane layouts, such as a signal electrode on the 1st substrate of the liquid crystal device concerning this embodiment. Outline composition of the liquid crystal device concerning this embodiment is carried out from the liquid crystal (not shown) enclosed between this 1st substrate, the 2nd substrate (not shown) in which the scanning electrode etc. were provided, and the 1st substrate and the 2nd substrate.
[0149]As shown in drawing 21, two or more signal electrode 310 -- is provided in the pixel field 303 on the 1st substrate 300 in the shape of a multiplex matrix. Especially, each signal electrode 310 -- comprises signal wiring partial 310b-- which connects these with two or more picture electrode partial 310a-- provided corresponding to each pixel in the shape of a multiplex matrix, and is ****(ed) in the direction of Y.
[0150]The numerals 350 are the liquid crystal drive circuits of 1 chip structure, and are this liquid crystal drive circuit 350 and the signal wiring portion 310b. -- The end side (the figure Nakashita side) is connected via 1st leading-about wiring 331 --.
[0151]Numerals 340 -- is an up-and-down electrical connection terminal, and this up-and-down electrical connection terminal 340 -- and a terminal provided on the 2nd substrate that is not illustrated are connected by up-and-down electrical connection material 341 --. The liquid crystal drive circuit 350 is connected with up-and-down electrical connection terminal 340 -- via 2nd leading-about wiring 332 --.
[0152]Picture electrode partial 310a-- consists of the thin-film transistor 120 concerning a 12th embodiment in a liquid crystal device of this embodiment.
[0153]According to the liquid crystal device of this embodiment, by consisting of the thin-film transistor 120 which requires the picture electrode portion 310a for a 12th embodiment, manufacture is easy, and is inexpensive and a high speed and a stable drive can be enabled a liquid crystal device in which a miniaturization and thin-film-izing are possible.
[0154][A 14th embodiment] A 14th embodiment explains the example of the luminescent device to which this invention is applied. Drawing 22 is a sectional view showing typically the luminescent device 140 concerning an example slack book embodiment of a semiconductor device.
[0155]The luminescent device 140 shown in drawing 22 is provided with the following.
It is an organic electroluminescence device which emits light according to electroluminescence (EL), and is the substrate 141.

The light emitting element part 140a formed on the substrate 140.
The light emitting element part 140a contains the anode 143, the negative pole 145, electron hole transportation / pouring layer 142, and the luminous layer 144. The insulating layer 148 is formed on the anode 143, and the opening 146 is formed in this insulating layer 148. Electron hole transportation / pouring layer 142 and the luminous layer 144 are formed in this opening 146. This electron hole transportation / pouring layer 142 and luminous layer 144 are arranged so that it may be put between the anode 143 and the negative pole 145.
[0156]A pair of electrode layers are constituted by the anode 143 and the negative pole 145. By impressing voltage between the anode 143 and the negative pole 145, an electron is poured into the luminous layer 144 for a hole from the negative pole 145 through electron hole transportation / pouring layer 142, respectively from the anode 143. Here, when a hole and an electron join together within the luminous layer 144, an exciton is generated and this exciton is deactivated, light arises.
[0157]According to the luminescent device of this embodiment, electron hole transportation / pouring layer 142 and the luminous layer 144 can be formed with the application of a formation method of a film pattern of an 11th embodiment. [in this case electron hole transportation / pouring layer 142 and the luminous layer 144] It is formed through a process of carrying out discharge of a liquefied thing (the 1st drop 142a) containing an ingredient which constitutes electron hole transportation / pouring layer 142, and the liquefied thing (the 2nd drop 144a) containing an ingredient which constitutes the luminous layer 144 continuously with a droplet discharging method. That is, with a droplet discharging method, after breathing out the 1st drop 142a and 2nd drop 144a, a solvent contained in these drops is evaporated and it can remove simultaneously. For this reason, at the time of solvent removal, an interface of electron hole transportation / pouring layer 142 and the luminous layer 144 is exposed, and it is not put to the atmosphere. Therefore, a state of an interface of electron hole transportation / pouring layer 142 and the luminous layer 144 can be kept very good. Thereby, since an interface of electron hole transportation / pouring layer 142 and the luminous layer 144 is formed homogeneously, the mobility of an electric charge in this interface is securable. As a result, the characteristic of an obtained luminescent device can be raised remarkably.
[0158]Next, an example of 1 experiment of a manufacturing method of this luminescent device 140 is explained with reference to drawing 23 (a) - drawing 23 (c) and drawing 24 (a) - drawing 24 (c). This manufacturing method is an example and can form an electrode, a luminous layer, etc. using the quality of the materials other than the quality of the material shown here.
[0159](Example of an experiment) First, as shown in drawing 23 (a), the anode 143 which consists of ITO(s) was formed on the substrate 141. Subsequently, as shown in drawing 23 (b), the insulating layer 148 of 2 micrometers of film thickness which consists of polyimide resin was formed on the anode 143. 30 micrometers in diameter and the opening 146 formed in pitch 40micrometer are formed in this insulating layer 148. In a process mentioned later, this opening 146 is formed in order to form electron hole transportation / pouring layer 142 and the luminous layer 144. Subsequently, as continuous processing of oxygen plasma and fluorocarbon plasma was performed and it was shown in drawing 23 (c) to this substrate 141, while carrying out liquid repelling of the surface of the insulating layer 148, the surface (bottom 146a of the opening 146) of the exposed anode 143 was made lyophilic. That is, in this process, as shown in drawing 23 (c), liquid repelling only of the surface of the insulating layer 148 is carried out. That is, the liquid repellence pattern 147 is formed in the surface of the insulating layer 148 of this process, and a lyophilic pattern is formed in the bottom 146a of the opening 146 of it.

[0160]Subsequently, PEPOT(polyethylene dioxythiophene)/PSS(polystyrene sulfonate) (by TRON P-water dispersion):8wt%, 10pl discharge of the solution which mixed gamma-glycidyloxy pro pith trimethoxysilane 0.05wt% is carried out toward the opening 146 isopropyl alcohol 5wt% methanol 5.5wt % water 81.5wt%, As shown in drawing 24 (a), the 1st drop 142a was formed in the opening 146.

[0161][subsequently ink jet head another before this 1st drop 142a evaporates] PPV(poly para-phenylene BINIREN)2wt% and methanol 20wt%, As 8pl discharge of the solution which mixed butyl rib TORU acetate 8wt% was carried out on the 1st drop 142a and it was shown in drawing 24 (b) 1 and 3-********- 2-imidazolidinone 70wt%, the 2nd drop 144a was formed on the 1st drop 142a. This the 1st drop 142a and 2nd drop 144a were carrying out layer separation, respectively.

[0162]Subsequently, processing was performed at 150 ** among a vacuum (1torr) for 4 hours, a solvent was completely removed from the 1st drop 142a and 2nd drop 144a, a film ingredient was solidified, and as shown in drawing 24 (c), electron hole transportation / pouring layer 142 and the luminous layer 144 were formed.

[0163]Subsequently, the Ca layer 145a of 50 nm of film thickness and the aluminum layer 145b of 200 nm of film thickness were formed on electron hole transportation / pouring layer 142 by vacuum heating vapor deposition. Thereby, as shown in drawing 22, the negative pole 145 which consists of the Ca layer 145a and the aluminum layer 145b was formed. Then, it closed by an acrylic resin for electrode protection (not shown). By the above process, the luminescent device 140 shown in drawing 22 was obtained.

[0164]As a result of investigating the luminescent property of the luminescent device 140 obtained by the above-mentioned process, drive voltage was 5V and luminosity 120 cd/m^2 and a luminescence life (luminosity reduction-by-half time) were 3000 hours.

[0165]According to the above-mentioned example of an experiment, the luminescent device excellent in luminescent property was able to be obtained.

[0166]According to the above-mentioned example of an experiment, a lyophilic pattern is formed in a field (bottom 146a of the opening 146) to form two or more film patterns (electron hole transportation / pouring layer 142 and the luminous layer 144) in, After forming the liquid repellence pattern 147 in the field (surface of the insulating layer 148) which does not desire formation of two or more of said film patterns, discharge of the 1st and 2nd drops 142a and 144a is carried out. Thereby, the 1st and 2nd drops 142a and 144a can be formed in a desired field. As a result, since it can form in the field of a request of two or more film patterns (electron hole transportation / pouring layer 142 and the luminous layer 144) alternatively, the film pattern of desired shape can be formed in a desired position.

[0167](Comparative example) On the other hand, after making the 1st drop 142a reach the bottom 146a of the opening 146, removing completely the solvent contained in the 1st drop 142a and solidifying the film formation ingredient as a comparative example, the luminescent device was formed by making the 2nd drop 144a breathe out. After forming the anode 143 and the insulating layer 148 on the substrate 141, the 1st drop 142a was made to specifically reach the bottom 146a of the opening 146 like the above-mentioned example 1 of an experiment. Subsequently, according to this comparative example, it processes at 150 ** among a vacuum (1torr) for 2 hours, After removing the solvent contained in the 1st drop 142a and solidifying a film formation ingredient, breathe out the 1st drop 142a on the 2nd drop 144a, and it processes at 150 ** among a vacuum (1torr) further after that for 2 hours, The solvent contained in the 2nd drop 144a was removed, and the film formation ingredient was solidified. The next

process created the luminescent device (not shown) like the above-mentioned example 1 of an experiment. As a result, drive voltage was 8V and luminosity 85 cd/m^2 and a luminescence life (luminosity reduction-by-half time) were 2000 hours. That is, even if the luminescent device of the comparative example impressed drive voltage higher than the luminescent device of the example of an experiment, luminosity was low and also its luminescence life was short.

[0168]By the above result, [the luminescent device of the above-mentioned embodiment] the film formation ingredient was solidified by removing simultaneously the solvent contained in the 1st and 2nd drops 142a and 144a -- electron hole transportation / pouring layer 142 and the luminous layer 144 were formed, without could fold and the interface of electron hole transportation / pouring layer 142 and the luminous layer 144 being exposed. For this reason, since the interface of electron hole transportation / pouring layer 142 and the luminous layer 144 will be in a good state, the mobility of the electric charge in said interface becomes good. As a result, the characteristic of the obtained luminescent device was able to be raised remarkably.

[0169][A 15th embodiment] A 13th embodiment explains the example of the electronic equipment to which this invention is applied. Electronic equipment equips this embodiment with the indicator (it mentions later) which consists of a luminescent device concerning the liquid crystal device concerning a 13th embodiment, or a 14th embodiment.

[0170]Drawing 25 (a) is a perspective view showing an example of a cellular phone. In drawing 25 (a), 600 shows the main part of a cellular phone, and 601 shows the indicator provided with the luminescent device concerning the liquid crystal device concerning a 13th embodiment, or a 14th embodiment.

[0171]Drawing 25 (b) is a perspective view showing an example of portable information processors, such as a word processor and a personal computer. In drawing 25 (b), 700 shows the indicator provided with the luminescent device concerning the liquid crystal device which an information processor and 701 require 703 for input parts, such as a keyboard, it starts the main part of an information processor, and requires 702 for a 13th embodiment, or a 14th embodiment.

[0172]Drawing 25 (c) is a perspective view showing an example of wrist watch type electronic equipment. In drawing 25 (c), 800 shows the main part of a clock and 801 shows the indicator provided with the luminescent device concerning the liquid crystal device concerning a 13th embodiment, or a 14th embodiment.

[0173]Since the electronic equipment shown in drawing 25 (a) - drawing 25 (c) is provided with the liquid crystal device or luminescent device of the above-mentioned embodiment, a high speed and the stable drive of a miniaturization and thin-film-izing of it are attained possible.

[0174]The apparatus etc. which were provided with a car navigation device, a pager, an electronic notebook, a calculator, a workstation, videophone, a POS terminal, an IC card, minidisc player, and touch panel other than what was mentioned above as electronic equipment of this embodiment can be illustrated. And it cannot be overemphasized that can apply the indicator mentioned above as an indicator of these various electronic equipment.

[0175]This invention is not limited to the embodiment mentioned above, and various modification is possible for it. For example, this invention includes the substantially same composition (for example, a function, a method and composition with same result or the purpose, and composition with same result) as the composition explained by the embodiment. This invention includes the composition which replaced the portion which is not essential as for composition of that the embodiment explained. This

invention includes the composition which can attain the composition or the same purpose of generating the same operation effect as the composition explained by the embodiment. This invention includes the composition which added known art to the composition explained by the embodiment.

[Brief Description of the Drawings]
[Drawing 1]It is a sectional view showing typically the formation method of the film pattern concerning a 1st embodiment to which this invention is applied.
[Drawing 2]It is a top view showing typically the film pattern formed by the formation method of the film pattern concerning a 1st embodiment.
[Drawing 3]It is a perspective view showing typically the film pattern formation device concerning a 2nd embodiment to which this invention is applied.
[Drawing 4]It is a top view showing typically the electric conduction film wiring concerning a 3rd embodiment to which this invention is applied.
[Drawing 5]Drawing 5 (a) is an extension mimetic diagram of the field B shown in drawing 4, and drawing 5 (b) is a figure showing typically the section in alignment with C-C of drawing 5 (a).
[Drawing 6]Drawing 6 (a) - drawing 6 (d) are the sectional views showing typically one manufacturing process of the electric conduction film wiring which relates to a 4th embodiment to which this invention is applied, respectively.
[Drawing 7]It is a sectional view showing typically the mounting structure of the semiconductor device concerning a 5th embodiment to which this invention is applied.
[Drawing 8]Drawing 8 (a) and drawing 8 (b) are the figures explaining the formation method of the film pattern concerning a 6th embodiment to which this invention is applied, and drawing 8 (c) is a top view showing typically the film pattern formed by the formation method of the film pattern concerning a 6th embodiment.
[Drawing 9]It is an exploded perspective view showing typically the noncontact card medium concerning a 7th embodiment to which this invention is applied.
[Drawing 10]Drawing 10 (a) is a top view showing typically one manufacturing process of the noncontact card medium shown in drawing 9, and drawing 10 (b) is a figure showing typically the section in J-J of drawing 10 (a).
[Drawing 11]Drawing 11 (a) is a top view showing typically one manufacturing process of the noncontact card medium shown in drawing 9, and drawing 11 (b) is a figure showing typically the section in J-J of drawing 11 (a).
[Drawing 12]It is a top view showing typically the electric conduction film wiring concerning an 8th embodiment to which this invention is applied.
[Drawing 13]Drawing 13 (a) - drawing 13 (c) are the sectional views showing typically one manufacturing process of the electric conduction film wiring shown in drawing 12, respectively.
[Drawing 14]It is a sectional view showing typically the formation method of the film pattern concerning a 9th embodiment to which this invention is applied.
[Drawing 15]It is a figure explaining one formation process of the formation method of the film pattern concerning a 9th embodiment to which this invention is applied.

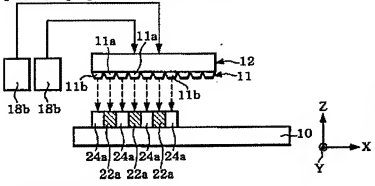
[Drawing 16]Drawing 16 (a) is a sectional view showing typically the mounting structure of the semiconductor device concerning a 10th embodiment to which this invention is applied, and drawing 16 (b) is an extension mimetic diagram of the field G of drawing 16 (a).
[Drawing 17]Drawing 17 (a) - drawing 17 (d) are the sectional views showing typically one manufacturing process of the mounting structure of the semiconductor device shown in drawing 16, respectively.
[Drawing 18]Drawing 18 (a) - drawing 18 (d) are the sectional views showing typically the drop formed by the formation method of the film pattern applied to an 11th embodiment to which this invention is applied, respectively.
[Drawing 19]Drawing 19 (a) is a top view showing typically the thin-film transistor concerning a 12th embodiment of example slack of the semiconductor device to which this invention is applied, and drawing 19 (b) is a figure showing typically the section in H-H of drawing 19 (a).
[Drawing 20]Drawing 20 (a) - drawing 20 (e) are the top views and sectional views showing typically one manufacturing process of the thin-film transistor shown in drawing 19, respectively.
[Drawing 21]It is a top view showing typically the 1st substrate of the liquid crystal device concerning a 13th embodiment of example slack of the electrooptics device to which this invention is applied.
[Drawing 22]It is a sectional view showing typically the luminescent device concerning a 14th embodiment of example slack of the luminescent device to which this invention is applied.
[Drawing 23]Drawing 23 (a) - drawing 23 (c) are the sectional views showing typically one manufacturing process of the luminescent device shown in drawing 22, respectively.
[Drawing 24]Drawing 24 (a) - drawing 24 (c) are the sectional views showing typically one manufacturing process of the luminescent device shown in drawing 22, respectively.
[Drawing 25]Drawing 25 (a) is a shown figure the cellular phone concerning a 15th embodiment of example slack of the electronic equipment to which this invention is applied, and, [drawing 25 (b)] It is a figure showing the portable information processor concerning a 15th embodiment of example slack of the electronic equipment to which this invention is applied, and drawing 25 (c) is a figure showing the wrist watch type electronic equipment concerning a 15th embodiment of example slack of the electronic equipment to which this invention is applied.
[Drawing 26]It is a flow chart explaining the formation method of the film pattern of a 1st embodiment.
[Drawing 27]It is a flow chart explaining the formation method of a common film pattern.
[Explanations of letters or numerals]
1 Ink jet head group
2 Direction guide shaft of X
3 Direction drive motor of X
4 Mounting base
5 Direction guide shaft of Y
The direction drive motor of 6 and 16 Y
7 Pedestal
8 Control device
10 Substrate
11, 11a, and 11b Nozzle
12 Ink jet head
14 Cleaning mechanism section

15 Heater
18a and 18b Ink tank
22 Electric conduction film
22a The 1st drop
24 Insulating film
24a The 2nd drop
30 Semiconductor IC chip
31 Substrate
32 Rearrangement terminal
34 Terminal
40 Printed circuit board
41 Base board
42 Electric conduction layer
50 CPU loading board
52 and 53 Ball bump
54 Cover
56 Shock absorbing material
58 CPU
62 Electric conduction film
62a The 1st drop
64 Insulating film
64a The 2nd drop
65 Wiring
66 and 68 Terminal
70 IC chip layered product
70a IC chip
71 Substrate
72 Head
73 Electric conduction layer
74 Ball bump
75 Opening
76 Contact part
77 Wiring layer
78 Pad
79 Adhesion material
80 Semiconductor IC chip
81 Substrate
82 Terminal
83 Insulating layer
84 Rearrangement terminal
85 and 87 Opening
89 Reinforcing member
91 Substrate

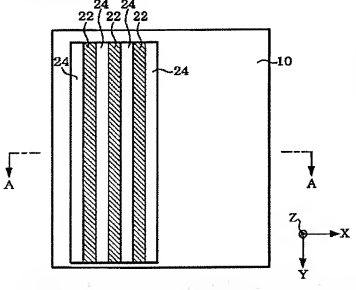
96 Crevice
100 Wiring formation device
112 Electric conduction film
112a The 1st drop
114 Insulating film
114a The 2nd drop
116 Crevice
118 Insulating layer
120 Thin-film transistor (TFT)
121 Substrate
122 Gate electrode
122a Coating film
124 Insulating layer
124a Coating film
125 Channel field
125a Crevice
126,127 A source / drain field
128,129 A source / drain electrode
140 Luminescent device
140a Light emitting element part
141 Substrate
142 Electron hole transportation / pouring layer
142a The 1st drop
143 Anode
144 Luminous layer
144a The 2nd drop
145 Negative pole
146 Opening
146a The bottom of an opening (lyophilic pattern)
147 Liquid repellence pattern
148 Insulating layer
149 Power supply
300 1st substrate
303 Pixel field
310 Signal electrode
310a Picture electrode portion
310b Signal wiring portion
331 1st leading-about wiring
332 2nd leading-about wiring
340 Up-and-down electrical connection terminal
341 Up-and-down electrical connection material
350 Liquid crystal drive circuit
400 Noncontact card medium

402 Card base
408 Integrated Circuit Sub-Division chip
412 Antenna circuit
418 Card cover
600 Main part of cellular phone
601 Indicator
700 Information processor
701 Input part
702 Indicator
703 Main part of information processor
800 Main part of clock
801 Indicator

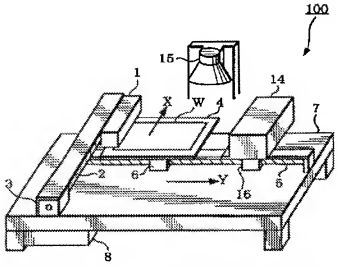
[Drawing 1]



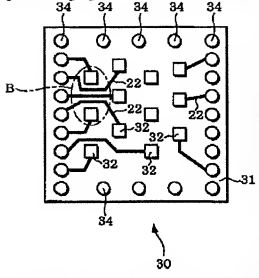
[Drawing 2]



[Drawing 3]

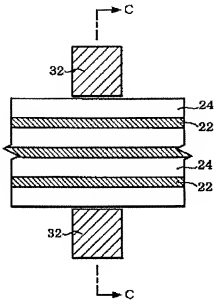


[Drawing 4]

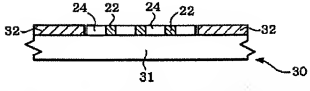


[Drawing 5]

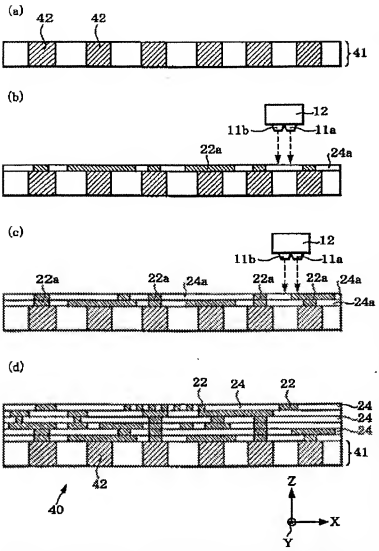
(a)



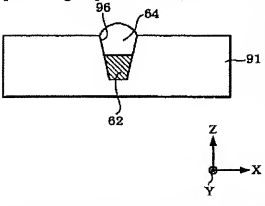
(b)



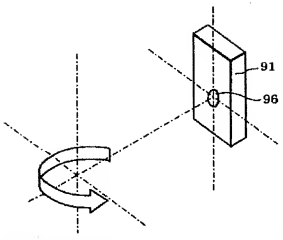
[Drawing 6]



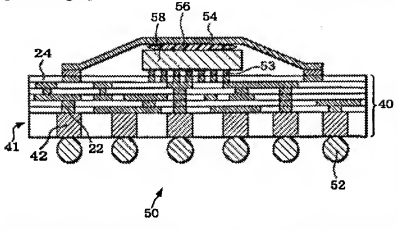
[Drawing 14]



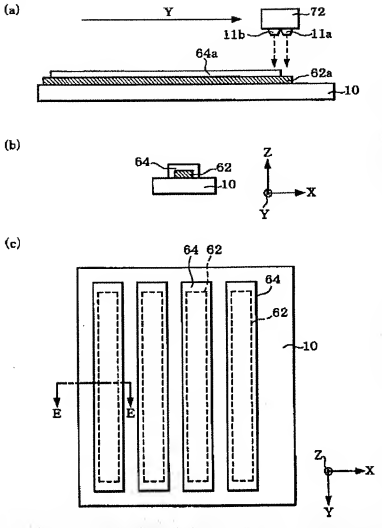
[Drawing 15]



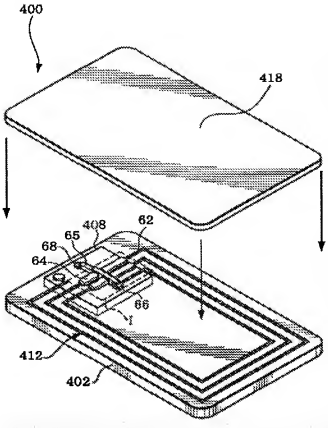
[Drawing 7]



[Drawing 8]

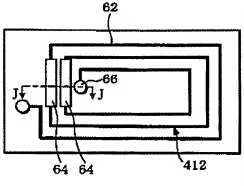


[Drawing 9]

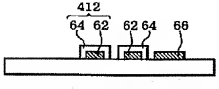


[Drawing 10]

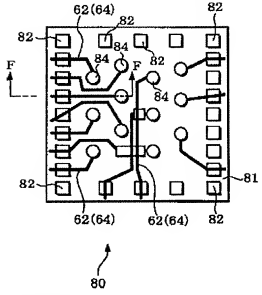
(a)



(b)

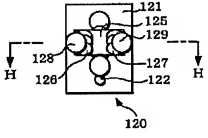


[Drawing 12]

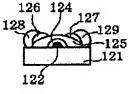


[Drawing 19]

(a)

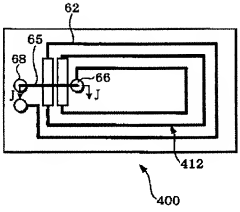


(b)

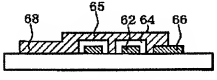


[Drawing 11]

(a)

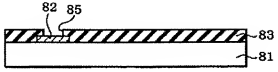


(b)



[Drawing 13]

(a)



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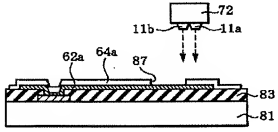
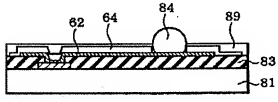
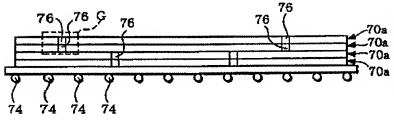


(c)

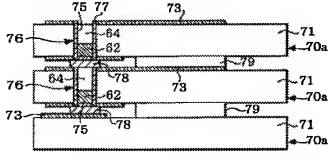


[Drawing 16]

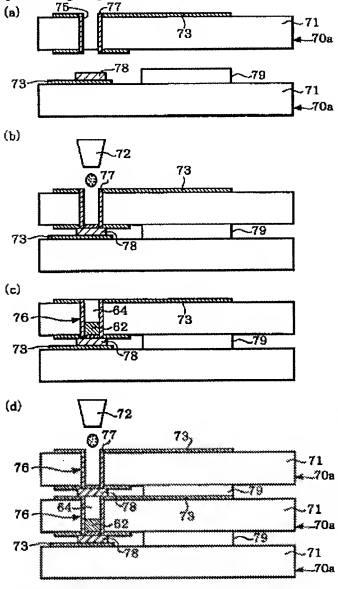
(a)



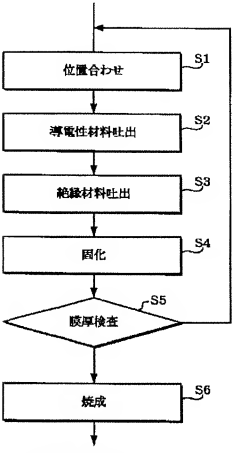
(b)



[Drawing 17]

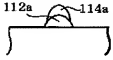


[Drawing 26]

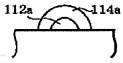


[Drawing 18]

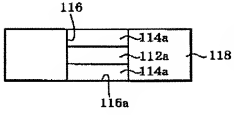
(a)



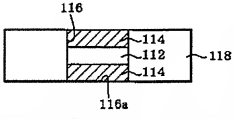
(b)



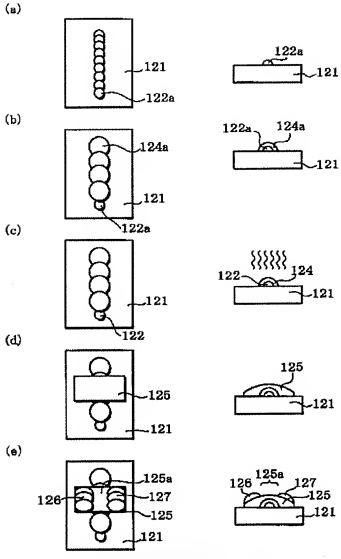
(c)



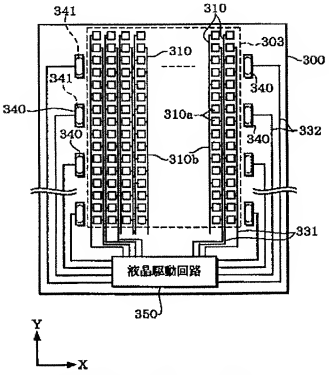
(d)



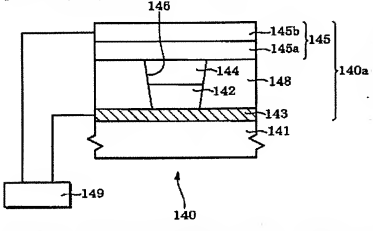
[Drawing 20]


(a)
121
122a
122a
121
(b)
124a
121
122a
122a
124a
121
(c)
121
122
122
124
121
(d)
125
121
125
121
(e)
125a
126
127
125
121
126
125a
127
125
121

[Drawing 21]

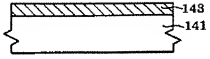


[Drawing 22]

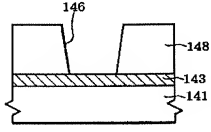


[Drawing 23]

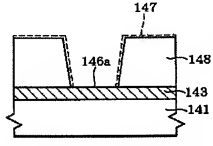
(a)



(b)

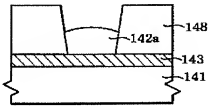


(c)

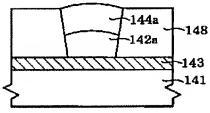


[Drawing 24]

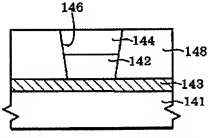
(a)



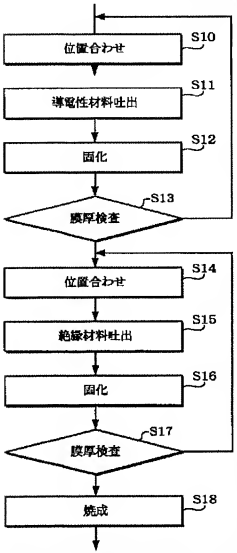
(b)



(c)

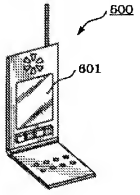


[Drawing 27]

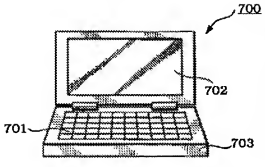

位置合わせ
S10
導電性材料吐出
S11
固化
S12
膜厚検査
S13
位置合わせ
S14
絶縁材料吐出
S15
固化
S16
膜厚検査
S17
焼成
S18

[Drawing 25]

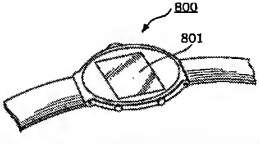
(a)



(b)



(c)



[Translation done.]